What is claimed is:

1.   A method for establishing a secure key between two stations, the method comprising:

   a) exchanging single photon signals between two quantum key distribution stations to form a plurality of raw keys at each station;

   b) performing error correction and privacy amplification on the raw keys to form a plurality of privacy amplified keys at each station;

   c) buffering the privacy amplified keys in each station to form matching key schedules at each station; and

   d) forming at least one expanded key from a key selected from the matching key schedules, wherein the at least one expanded key is suitable for one-time pad encryption of information to be exchanged between the two stations.

2.   The method of claim 1, including:

   a) encrypting information using the at least one expanded key as a one-time pad; and

   b) transmitting the encrypted information between the two stations.

3.   A method of sending encrypted information between two stations, comprising:

   a) establishing a raw key between the two stations using quantum key distribution;

   b) establishing a privacy amplified key from the establish raw key;

   c) providing the option of encrypting data using a one-time pad based on either the privacy amplified key as an unexpanded key, or an expanded version of the privacy amplified key as an expanded key; and

   d) sending encrypted information between the two stations using a one-time pad based on either the unexpanded key or the expanded key.

4. The method of claim 3, including:

a) expanding one or more of the privacy amplified keys; and

b) storing at each station the one or more expanded keys in a key schedule.

5. The method of claim 3, including:

a) storing at each station one or more unexpanded keys in a first key schedule;

b) storing at each station one or more expanded keys in a second key schedule; and

c) encrypting information using one-time pads based on keys from at least one of the first and second key schedules when raw keys cannot be exchanged between the stations.